
STAGE 3—PROPOSE EXPLANATIONS AND SOLUTIONS AND ASK NEW QUESTIONS

In stage 3, teachers help students refine their understanding of the data they collected. Through group discussions, students learn to propose, evaluate, and accept alternative viewpoints, to listen and question, and persist in seeking satisfying explanations for the data they collected.

Teacher Tips

1. At the end of the field/laboratory experience, all teams come together to exchange physical, chemical, and biological data. They share the knowledge they have developed and talk about how it might be used to design a solution to the problem. The purpose of this exercise is to continue to allow students to apply their expertise to the problem, putting together “pieces of the puzzle” to understand the nature of the problem and reach an appropriate solution.
2. Is there a reason to be concerned? Is the town causing the problem or are there other factors that come into play? (For example, How would the entrance of another stream, agricultural activities, and site characteristics influence the results?)
3. Depending on values determined in the data analyses, students decide whether the town is impacting the ecology of the stream. Discuss differences in organisms collected. If a difference in FBI is found, discuss what you would do next to determine what is causing the difference.
4. What do we know? What do we think we know? What more would we like to know? What can we tell the city council? These questions are the focus of stage 3.



Activity: Process and Share Information

Now that students have a “picture” of the stream based on the physical, chemical, and biological assessments they have conducted, the question becomes how can they use what they know to address the problem? What “answer” can they give their client (the city council) about the research problem? Do the town’s activities affect the river?

A discussion ensues focusing on what students think they know and how confident they are in the data they have collected. In the course of the discussion students begin to understand the process they have undertaken, which models how scientists have to respond to a research problem, based on what they know and don’t know. They should recognize the weaknesses associated with the results, that a level of uncertainty exists. They should be able to identify questions for further investigation.

